

# PATENT ABSTRACTS OF JAPAN

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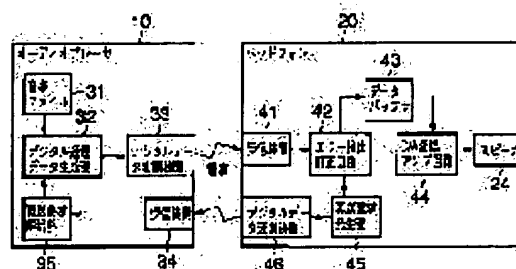
(21)Application number : 2000-302666 (71)Applicant : TOSHIBA CORP  
(22)Date of filing : 02.10.2000 (72)Inventor : WATANUKI MASANORI

## (54) MUSIC REPRODUCING DEVICE AND AUDIO PLAYER AND HEADPHONE

### (57)Abstract:

**PROBLEM TO BE SOLVED:** To provide a music reproducing device without deterioration in sound quality, which allows people to listen to the same music through the use of headphones and attains switch connection to other device.

**SOLUTION:** An audio player 10 uses a digital transmission data generating section 32 to generate digital transmission data, and a digital data modulator 33 wirelessly transmits the data to the headphone 20. The headphone 20 uses a receiver 41 to receive the data, an error detection correction circuit 42 corrects an error and stores the resulting data to a data buffer 43, a digital/analog converter amplifier circuit 44 sequentially reads the data to drive a speaker 24. Furthermore, in the case that the error cannot be corrected or part of the data cannot be received, a re-transmission request generating section 45 generates a re-transmission request command and transmits it to the audio player 10. The audio player 10 receives the re-transmission request command, and a re-transmission request interpret section 35 interprets the command to instruct re-transmission of data to the digital transmission data generating section 32.



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## LEGAL STATUS

[Date of request for examination]

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

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[Date of requesting appeal against examiner's decision of rejection]

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CLAIMS

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[Claim(s)]

[Claim 1] The audio player characterized by providing the player body of a circle configuration, the display panel prepared in the front face of this player body, the player actuation switch formed in the periphery of this display panel pivotable, and the antenna for radio formed in the tooth back of the above-mentioned player body.

[Claim 2] The audio player characterized by providing the player body of a circle configuration, the display panel prepared in the front face of this player body, the player actuation switch formed in the periphery of this display panel pivotable, the antenna for radio formed in the tooth back of the above-mentioned player body, and the card slot prepared in the side face of the above-mentioned player body.

[Claim 3] The lug prepared in the body of headphone of a circle configuration, the loudspeaker prepared in one field of this body of headphone, the antenna for radio formed in the field of another side of the above-mentioned body of headphone, and the outside of the above-mentioned body of headphone, or the headphone characterized by providing \*\*.

[Claim 4] The lug which is prepared in the body of headphone of a circle configuration, the loudspeaker prepared in one field of this body of headphone, the antenna for radio formed in the field of another side of the above-mentioned body of headphone, and this antenna periphery pivotable, and is prepared in the rotary switch which carries out ON/OFF of the power source, and the outside of the above-mentioned body of headphone, or the headphone characterized by providing \*\*.

[Claim 5] In the music regenerative apparatus which connects headphone with an audio player by wireless the above-mentioned audio player A transmitting means to transmit to headphone one by one by the electric wave of the digital data transfer which generates music data and contains an error correcting code, It is based on the playback demand detected by playback demand detection means to detect the playback demand from the above-mentioned headphone, and the above-mentioned playback demand detection means.

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DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to a music regenerative apparatus, and the audio player and headphone which are connected with a pocket mold audio player using the electric wave of a digital transfer of headphone.

[0002]

[Description of the Prior Art] Conventionally, in the pocket mold audio player, headphone are connected with the audio player in code. For this reason, it is hard to use jogging a code becoming a user's obstacle, for example, listening to music etc. in the case of a sport. Moreover, in order to connect an audio player with other devices, while an interconnection cable is required, degradation of tone quality arises. Moreover, it cannot be used to use headphone for other purpose unless it reconnects a code. Furthermore, it is difficult to connect two or more headphone to an audio player. That is, in order to connect two or more headphone to an audio player, the jack which connects headphone to an audio player side is needed, and the limit on structure arises.

[0003] For this reason, by the latest pocket mold audio player, the thing of a wireless mold which sent speech information to headphone by wireless analogically using FM modulation or infrared radiation is considered.

[0004]

[Problem(s) to be Solved by the Invention] However, in the above-mentioned conventional wireless pocket mold audio player, since speech information is transmitted by the analog, there is a problem that tone quality deteriorates. Moreover, in the thing using infrared radiation, since directivity is strong, two or more headphone cannot be connected, and even the thing using FM modulation does not have the composition of still connecting two or more headphone. Furthermore, in the thing of the conventional wireless mold, change connection of an audio player or the headphone cannot be made at other devices.

[0005] It aims at offering the music regenerative apparatus which two or more men can listen to the same music using two or more headphone while this invention was made in order to solve the above-mentioned technical problem, and it does not have degradation of tone quality, and can switch an audio player and headphone respectively easily because of other purposes, and an audio player and headphone.

[0006]

[Means for Solving the Problem] In the music regenerative apparatus with which the 1st invention connects headphone with an audio player by wireless the above-mentioned audio player A transmitting means to transmit to headphone one by one by the electric wave of the digital data transfer which generates music data and contains an error correcting code,

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TECHNICAL FIELD

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[Field of the Invention] This invention relates to a music regenerative apparatus, and the audio player and headphone which are connected with a pocket mold audio player using the electric wave of a digital transfer of headphone.

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PRIOR ART

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[Description of the Prior Art] Conventionally, in the pocket mold audio player, headphone are connected with the audio player in code. For this reason, it is hard to use jogging a code becoming a user's obstacle, for example, listening to music etc. in the case of a sport. Moreover, in order to connect an audio player with other devices, while an interconnection cable is required, degradation of tone quality arises. Moreover, it cannot be used to use headphone for other purpose unless it reconnects a code. Furthermore, it is difficult to connect two or more headphone to an audio player. That is, in order to connect two or more headphone to an audio player, the jack which connects headphone to an audio player side is needed, and the limit on structure arises.

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EFFECT OF THE INVENTION

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[Effect of the Invention] Since digital music data are transmitted to headphone from the audio player according to this invention as a full account was given above, tone quality does not deteriorate and it can maintain at the condition of high quality. Moreover, since data are broadcast again when an error correction is not made, or when an electric wave breaks off and some data are not able to be received while establishing an error detection correction circuit in headphone and performing an error correction, a way piece and degradation can be certainly prevented for music data. Furthermore, since digital music data are transmitted on radio from the audio player, two or more men can listen to the same music, using headphone two or more. Moreover, since it has the transmitter-receiver, respectively, an audio player and headphone can be switched easily [ electronic equipment not only with transmission and reception of music data but other purposes ].

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TECHNICAL PROBLEM

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[Problem(s) to be Solved by the Invention] However, in the above-mentioned conventional wireless pocket mold audio player, since speech information is transmitted by the analog, there is a problem that tone quality deteriorates. Moreover, in the thing using infrared radiation, since directivity is strong, two or more headphone cannot be connected, and even the thing using FM modulation does not have the composition of still connecting two or more headphone. Furthermore, in the thing of the conventional wireless mold, change connection of an audio player or the headphone cannot be made at other devices. [0005] It aims at offering the music regenerative apparatus which two or more men can listen to the same music using two or more headphone while this invention was made in order to solve the above-mentioned technical problem, and it does not have degradation of tone quality, and can switch an audio player and headphone respectively easily because of other purposes, and an audio player and headphone.

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MEANS

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[Means for Solving the Problem] In the music regenerative apparatus with which the 1st invention connects headphone with an audio player by wireless the above-mentioned audio player A transmitting means to transmit to headphone one by one by the electric wave of the digital data transfer which generates music data and contains an error correcting code, It is based on the playback demand detected by playback demand detection means to detect the playback demand from the above-mentioned headphone, and the above-mentioned playback demand detection means. It has a retransmission-of-message means to broadcast the demanded data again to the above-mentioned headphone. The above-mentioned headphone A receiving means to receive the electric wave transmitted from the above-mentioned audio player, An error detection correction means to detect and correct the error of the data received by this receiving means, The data buffer which stores the music data by which correction was carried out [ above-mentioned ], and a means to begin to read the music data stored in this data buffer one by one, and to drive a loudspeaker,

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## DESCRIPTION OF DRAWINGS

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### [Brief Description of the Drawings]

[Drawing 1] Drawing showing the appearance configuration of the audio player concerning the 1st operation gestalt of this invention.

[Drawing 2] Drawing showing the appearance configuration of the headphone in this operation gestalt.

[Drawing 3] Drawing showing the appearance configuration at the time of storing a microphone to headphone.

[Drawing 4] The block diagram showing the circuitry of the audio player concerning the 1st operation gestalt of this invention, and headphone.

[Drawing 5] The block diagram showing the circuitry of the audio player concerning the 2nd operation gestalt of this invention, and headphone.

[Drawing 6] The block diagram showing the circuitry of the audio player concerning the 3rd operation gestalt of this invention, and headphone.

[Drawing 7] The block diagram showing the circuitry of the microphone section prepared in the headphone concerning the 4th operation gestalt of this invention.

[Drawing 8] The block diagram showing the circuitry of the actuation switch section of the headphone concerning the 5th operation gestalt of this invention, and the control section of an audio player.

[Drawing 9] The block diagram showing the circuitry of the microphone section of the headphone concerning the 6th operation gestalt of this invention, and the control section of an audio player.

[Drawing 10] The block diagram showing the circuitry of the audio player concerning the 7th operation gestalt of this invention, and headphone.

[Drawing 11] The block diagram showing the circuitry of the headphone concerning the 8th operation gestalt of this invention.

### [Description of Notations]

10 Audio Player

11 Case Body of Audio Player

12 Display Panel

13 Audio Actuation Switch

14 Antenna

15a, 15b Switch for volume control

16 Card Slot

20 Headphone

20a L side headphone  
20b R side headphone  
21 Case Body of Headphone  
22 ON/OFF Switch  
23 Antenna  
24 Loudspeaker  
24a L side loudspeaker  
24b R side loudspeaker  
25 Lug or \*\*  
31 Music File  
32 Digital Transmit Data Generation Section  
33 Digital Data Modulator  
34 Receiving Set  
35 Resending Demand Interpretation Section  
41 Receiving Set  
42 Error Detection Correction Circuit  
43 Data Buffer  
44 D/A Conversion Amplifier Circuit  
45 Resending Demand Generating Section  
46 Digital Data Modulator

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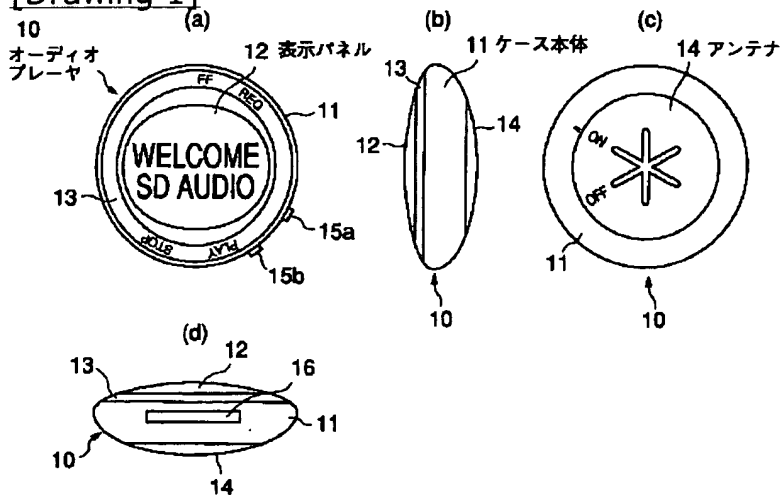
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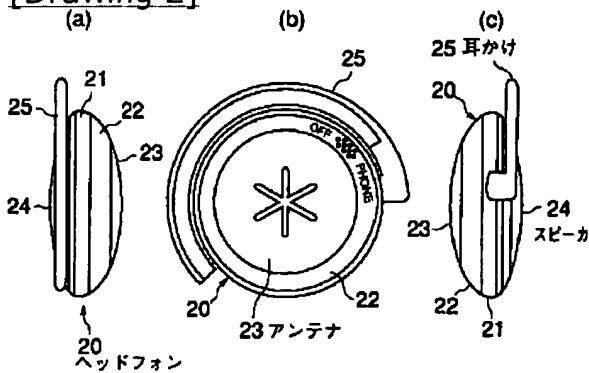
## DRAWINGS

[Drawing 1]

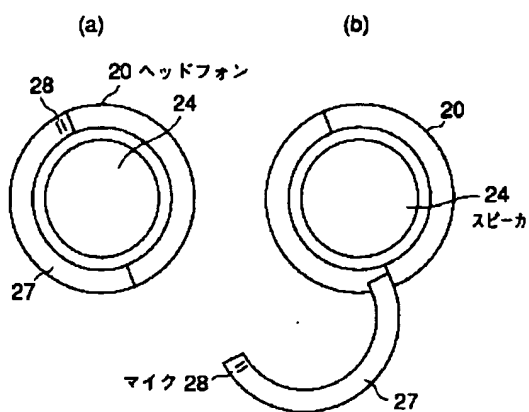


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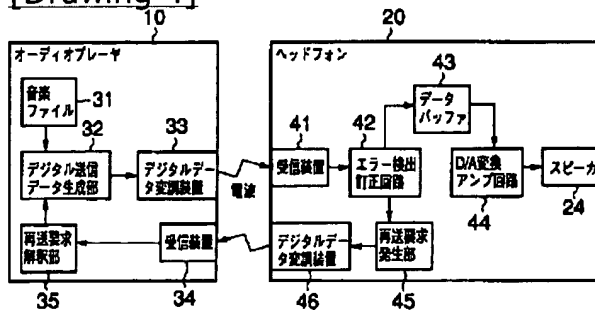
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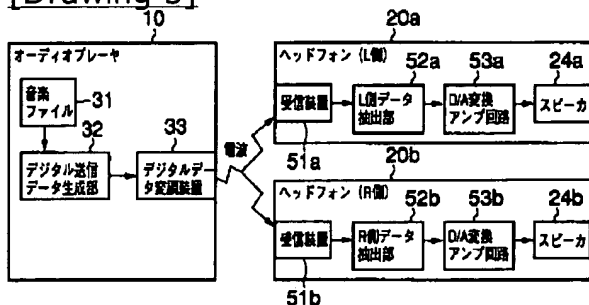
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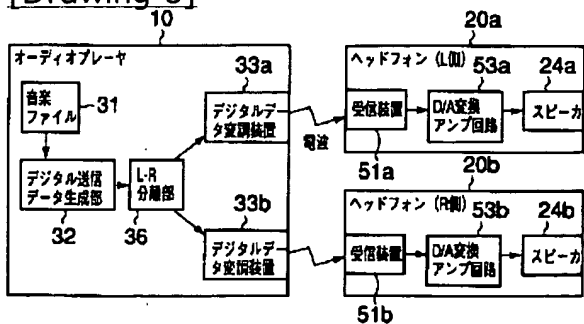
[Drawing 4]



[Drawing 5]

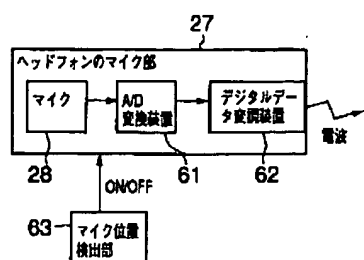


[Drawing 6]

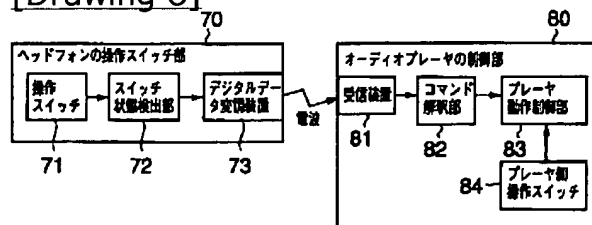


[Drawing 7]

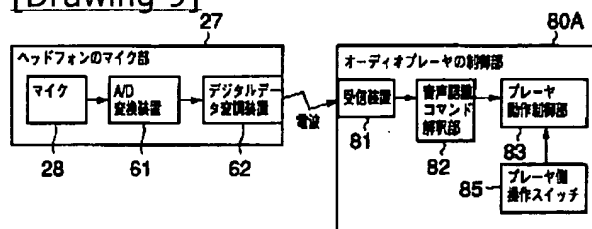
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[Drawing 8]

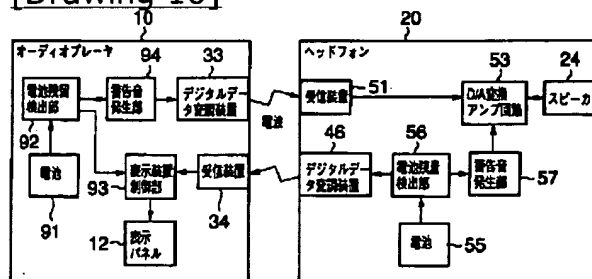


[Drawing 9]

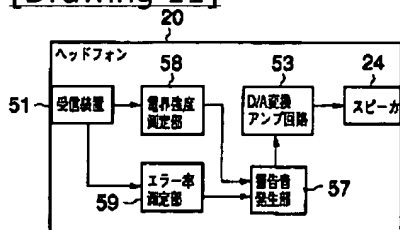


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[Drawing 10]



[Drawing 11]



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